Space Weather Forecast

Issued on Friday, 23 June 2023 at 13:02 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor/Moderate R1/R2 Radio Blackouts likely throughout. Slight Chance of Minor Geomagnetic Storm days 1 and 2.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate in the last 24 hours, with two Moderate class flares. There are currently 15 regions on the visible disc, of which 9 are numbered. Out of these AR3341 has been the most active, producing the Moderate class flares, but other regions have also produced Common class flares, mainly from regions which have been classified as moderately magnetically complex. The remaining regions on the visible disc are magnetically simpler, but not all smaller in size. Most of the 15 regions on the disc have shown little or no change over the past 24 hours, apart for AR3337 which has continued to show growth and complexity, whilst AR3344 has rapidly declined and is about to rotate off the disc.

Currently no new Earth directed Coronal Mass Ejections (CME's) are expected, despite a northwestern solar quadrant filament becoming mobile from 22/0300UTC. No associated CME has become apparent in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind showed an declining weak connection to a 'coronal hole' fast wind.

Solar wind speeds started the period at slightly elevated levels around 430km/s but then gradually decreased to end the day at background levels, around 380 km/s. The strength of the magnetic field was at weak levels throughout. The important north-south variation of the magnetic field was predominantly weakly south. The net result of the above solar wind measures was for Quiet to Unsettled geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms have been observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be moderate, with isolated or occasional Moderate-class flares and a slight chance of Strong-class flares.

Solar Wind / Geomagnetic Activity: With no Earth directed CME's expected and only little or none coronal hole influence, no significant geomagnetic activity is expected. The solar wind is expected to remain at background to slightly elevated levels today and tomorrow (23rd and 24th). Geomagnetic activity is expected to be Quiet to Unsettled, with a slight chance of G1/Minor geomagnetic storms occurring today and early tomorrow. Thereafter background solar winds and Quiet geomagnetic conditions are expected.

Energetic Particles / Solar Radiation: There remains a daily slight chance of reaching the S1/Minor Storm threshold given the sheer number of sunspot regions and complexity of the

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current front-side. On balance the risk is also felt to rise slightly, as fewer large sunspots are moving away from the best-connecting (with Earth) western solar horizon (on the far side) than are moving towards it (on the front side). This leads to a gradual increase in risk, although it remains the case that no recent even very modest proton-generating events have been observed.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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